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How to cite:

Piccolo, Lara; Meesters, Kenny and Roberts, Shadrock (2017). Co-designing for Community Resilience Beyond the Local. In: Workshop Participatory Design, beyond the local, 8th conference on Community & Technologies, 27 Jun, Troyes.

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Version: Accepted Manuscript

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Co-designing for Community Resilience Beyond the Local

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ABSTRACT

In this position paper we highlight our strategy for co-creating a platform to support community resilience that goes beyond a situated research. We first engage with a diverse set of stakeholders to conceive the design problem, and then we address the implementation aspects with local communities. We briefly illustrate a number of methods and strategies used to identify and extract the general socio-technical requirements from communities in different contexts.

KEYWORDS

Community resilience, Human-computer interaction, Crisis

1 INTRODUCTION

The design challenge reported in this paper refers to building a collective resilience platform to help communities to reconnect, respond to, and recover from crisis situations. In technical terms, we are adding new intelligent algorithms to the widely used Ushahidi crisis mapping tool¹. The platform has been co-created with multiple, local and distributed, communities. Although participatory design activities have been situated, therefore dealing with particular social issues and immersed in a socio-cultural reality, the resulting platform should keep its versatility as a global player.

We understand that co-designing a digital platform goes beyond discussing features and co-creating graphical elements with end users. To actually build a systemic view of the technical artefact under conception, the design should comprehend articulation of meanings among multiple stakeholders, and eliciting requirements with a socio-technical approach, considering also the potential impact of the new artefact on the community.

To this end, our design initially brought into discussion the meaning of community resilience, supported by a digital and social tool with some community leaders across the world. Once a general and global picture of the design problem was created and translated into socio-technical requirements (**what** to design), we have conducted some participatory design workshops with specific communities to then define **how** to develop the platform.

In this paper, we briefly describe some strategies and methods based on the Organisational Semiotics [5] [1] that we applied to understand our design problem "beyond local", as a preparation step for planning and executing the participatory design workshops.

2 CO-DEFINING COMMUNITY RESILIENCE

Initially building the concept from the literature, our research understands community resilience driven by technology as "a process

*of continuously enabling a broad range of actors to acquire a relevant, consistent and coherent **understanding** of a stressing situation, **empower** decision makers and trigger **community engagement** on response and recovery efforts, including long term mitigation and preparation."* [4].

Situating this definition, we interviewed 8 community leaders to understand the meaning of community resilience and the role of technology in their own contexts: 3 in Nepal; 2 in Nigeria; 2 in Indonesia; and 1 in India. The social issues they were fighting against include securing shelter and new ways of subsistence after an earthquake, elections monitoring against corruption and violence, sexual harassment and abuse, pursuing human rights, youth empowerment, and environmental issues.

For analysing the leaders' notion of community resilience, we drew a general picture by mapping the main forces revealed in three layers: informal, formal, and technical (Figure 1). Technical aspects are in the core, surrounded by the formal level, where elements that regulate the way people act are. People's beliefs, values, intentions and motivations are in the informal level. Following this metaphor of the "Semiotic Onion" [6], the three levels constantly influence each other from the moment the technology is conceived until the appropriation by a social group [1] [6].

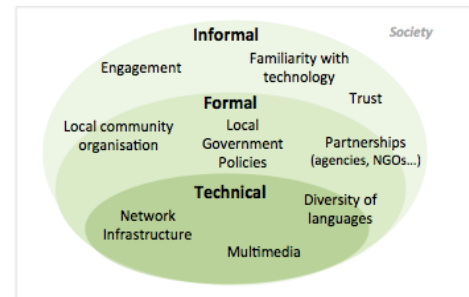


Figure 1: Key elements of designing for community resilience in the technical, formal and informal levels

The main challenges revealed in the informal level are related to engaging local people and policy makers to use a platform. The lack of familiarity with technology or specifically with the platform were frequently cited as barriers for engagement. Still in the informal level, the platform should be perceived as trustworthy and reliable by all users and stakeholders. The *informal* and *formal* aspects are related to the organisation of the communities, referring to the way they are structured to work and to interact with others, and partnerships between communities, agencies, responders, NGOs, etc. These aspects differ from one scenario to another, and the platform may improve such connections and communication. The platform

¹<https://www.ushahidi.com>

also has to be in line with local government policies, not only to be accepted by them, but also adopted for influencing decision making. Technically speaking, the most evidenced problems are network infrastructure, which may be precarious in some disaster situations, the desired integration with other media and communication platforms, such as WhatsApp, phone (voice platforms), and, finally, the challenge of dealing with different languages, which may even co-exist in the same scenario. The analysis evidenced that engaging a community encompasses not only raising awareness of their problems and possible solutions, but also how to use the platform in technical terms. The introduction of a platform to promote community resilience should consider: i) Develop digital literacy; ii) Develop adaptive capacity; iii) Raise community voice through social media to influence local government decisions; and iv) Involve policy makers and responders with the platform.

3 SOCIO-TECHNICAL REQUIREMENTS

To understand the way community leaders deal with information and also to translate their current practices and wishes into socio-technical requirements, we relied on the representation of the “semiotic ladder” (Figure 2), a framework that considers how information operates in distinct levels. The six levels of Semiotic Ladder are represented as steps from the perspective of physical world, empirics, syntactics, semantics, pragmatics, and the social world. Issues at the three lower layers will answer questions as to how information is structured, used, transmitted, what its properties are, etc. The upper layers are concerned with the use of signs, the meaning in the communication, intentions, etc. [5]. This structure evidences the information that are part of the IT systems and those related to the social environment.

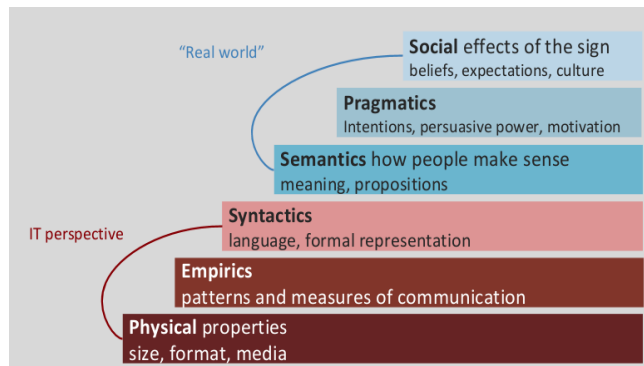


Figure 2: 6 steps of the Semiotic ladder

Some examples of concerns and wishes similarly reported by at least 3 leaders interviewed are *People should not be afraid of making a report due to conflicts with other stakeholders. Convince the community that the platform is meant to help, not to manipulate.* in the **social** level; *Complement the platform with physical meetings within the community on how to solve issues* in the **semantics**; *For every reported issue collect geographic coordinates, date, anonymity of the reporter, pictures, source, issue* in the **empirics** level.

4 DESIGN WORKSHOPS

Two participatory design workshops focusing on the implementation and integration of requirements happened in February of 2017 in Nepal. Even though Nepal has particularities when dealing with disasters, like the topography that strongly influences logistics, the diversity of communities involved in the resilience process provided us with a good sample of different stakeholders' perspective.

Different groups engaged in recovering from an earthquake were involved in these workshops. Residents, volunteers, technical communities, students and professionals affiliated with crisis management institutions participated in the activities, which included interviews and focus groups beyond participatory design [3]. Workshops participants were invited to first criticise the present, then to envision the future, and moving from the present to the future.

Results pointed out both digital and non-digital solutions related, for instance, to ways of sharing and presenting information, integration of different communication channels and social media, and the evident need to check the validity of the information, and avoiding people to spread contradictory and untrustworthy information.

5 DISCUSSION

To achieve social impact by means of a technical intervention, it is essential to consider in the design the sociocultural context where the artefact is going to be used. The participatory design workshops aimed to reveal socio-technical and cultural elements to be addressed in the implementation of a tool to be accepted and adopted. As Bodker [2] states, “*interaction needs to be understood and addressed in the context of people being together and sharing.*”

Our strategy to address both general needs/wishes and to co-design solutions with stakeholders started at the macro level and then moved to the micro, local, level. We first aligned general perspectives from different contexts to build a general picture of the design problem, to then address implementation aspects (the *how* to develop) locally, in such way that the communities' needs and wishes can be considered as instances of the design problem.

This is a work in progress and the results of the design workshops are still being processed. Then we will be able to properly compare the outcome in terms of local/global, as well as the effectiveness of the design solutions to cope with disasters in different contexts.

6 CONCLUSIONS

This paper reported an ongoing research that aims to co-create a solution with communities, but aiming at a solution to be adopted beyond the local. We illustrated methods to address socio-technical elements in preparation of participatory design activities.

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